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in which an operation would be justifiable, there is no excess of fluid, and in no stage is the excess of fluid of more than secondary importance. We may, therefore, conclude with Revington that the results in Dr. Tuke's operation are quite insignificant; that the results of Dr. Shaw's operation are most probably due to a remission; that the pathology upon which the operations were founded is opposed to all the best knowledge on the subject, and that the collation of two cases warrants nothing so clearly as the opinion that little good can be expected from the operation of trephining in General Paralysis.

III.—EXPERIMENTAL.

Ueber das Erkennen der Schallrichtung. J. VON KRIES. *Zeitschrift für Psychologie.* Bd. I (1890), H. 4—5, S. 235.

The ear perceives the direction and to some extent the distance from which sounds reach it; is this a judgment based upon the difference of the primary sensations reaching the two ears, or is it the more or less simple sensation of a special organ? The results of a very few rough trials will convince any one that right and left location is much more exact than location in any direction in the median plane; and this fits very well with the theory that sound is located by the difference of intensity of sensation in the two ears, because in the last case the two ears are always equally stimulated. Such recognition of direction in the median plane as is actually found has then to be explained by changes in the quality or intensity of the sound as its point of production is shifted about the head in that plane. Even this ought to fail, however, in the case of sounds with the quality and intensity of which the experimentee is unfamiliar, and this is the point which v. Kries set himself to try. The sounds of a telephone, of whistles, of bits of wood or metal snapped together—all of them variable to a certain degree in quality and intensity at will—were produced at different points in the median plane. The experimentee had to decide between but two possible locations (*e. g.* before or behind); he was kept in ignorance of the correctness of his answers, and in general every precaution was taken to prevent his learning the character of the sounds so as to be able to judge by that of their positions—as also to prevent a betrayal in any other way of their location. The experiments were made largely upon v. Kries and his assistant, but in addition some 22 students were also tested. In the first experiments (comparing forward-and-upward with backward-and-upward, telephone click as stimulus) the location was very uncertain; the next set (forward-and-upward as compared with forward-and-downward, whistle stimulus) gave much better results, as did also the next (upward compared with backward, stimulus by snapping coin). In other experiments where a continuous noise was produced by the telephone for 0.5—1 sec., the location was still more exact; *e. g.*, v. Kries, with before and behind as directions, made 39 correct judgments out of 44 trials, 4 times was in doubt, and only once answered incorrectly. On the 22 students very few trials were made, only five or six on each (comparing backward with forward) so as to exclude still further the possibility of learning the sounds. On the whole, the results of these experiments did not show exactness of location, a fact not much to be wondered at, perhaps, in so few experiments, but did show very great individual differences in this power. One student answered the first six times correctly, in an additional 30 trials was right 29 times, and showed an almost equally exceptional power in recognizing other directions.

For the detail of the experiments, as for points of incidental interest, the reader is referred to the original. Among others, however, may be mentioned the following: The occurrence of constant tendencies to say

one particular direction, however the actual direction might be changed; the experiments on ability to recognize the distance of a sound, which seemed to show that it did not depend to any great extent on the loudness; also those on the simultaneous recognition of the direction of two sounds or a sound and a noise; the author's criticism of the Lotze theory of local signs for vision and the similar theory of Münsterberg for auditory localization. Von Kries concludes somewhat as follows. Two things appear from these experiments, in spite of their relatively small number: First, an approximately certain median location is possible under some circumstances (at least in case of discriminating before and behind), even when the sounds used change irregularly from experiment to experiment in intensity, quality, and distance; second, that under other circumstances the location is remarkably uncertain. [To the reviewer it seems regrettable that von Kries did not experiment with the experimentee's head fixed, (he was only instructed to keep it still); for certainly in the case of sounds which last an appreciable length of time a very slight, and possibly unconscious, motion of the head might be expected to be an immense aid in deciding between before and behind.]

E. C. S.

Zur interauralen Lokalisation diotischer Wahrnehmungen. KARL L. SCHAEFER. *Zeitschrift für Psychologie*, Bd. I (1890), H. 4—5, S. 300.

Equal intensity of sound in the two ears regularly gives median location, but intercranial location only under certain circumstances. Sylvanus Thompson observed that when a telephone is held against each ear a single intercranially located sound is heard, provided that the diaphragms of the two telephones vibrate at the same rate, with the same amplitude and in contrary directions, *i. e.* both at the same time toward the head or both away from it. When the last condition is not fulfilled the sound is double and located in both ears. The explanation of this is briefly as follows: Sounds are located on the side on which they are most intensely heard; if the intensity alternates slowly, they seem to shift from ear to ear; if the shifting is very rapid they may appear to be located in both ears; such an alternation of intensity and quality is given by the telephone diaphragms on their inward and outward swings. Intercranial location, as opposed to extracranial, seems to depend on the estimated nearness of the individual sounds (a stimulus to a single ear never produces it), and this in turn seems influenced by intensity. If the single sounds are located away from the ears, the location of the combined sound is extracranial; if in the ears, intercranial. For the simple and interesting experiments which support these conclusions the original should be consulted.

Urtheilstäuschungen nach Beseitigung einseitiger Harthörigkeit. W. VON BEZOLD. *Zeitschrift für Psychologie*. Bd. I, 1890, H. 6, S. 486-487.

Von Bezold relates the following interesting experience of his student days. At that time he suffered for a considerable time from extreme deafness in the left ear, which later proved to be due to a wad of cotton which had been driven in against the ear-drum and there become fixed. When this was removed, the resulting illusions were of striking intensity. Turning the leaves of a book under such circumstances "produces a noise that can only be compared to that of a powerful waterfall, and would rise to pain, if the sensation were not diminished by stopping the ear with cotton." Still more important were the illusions of localization due to the disproportionate sensitiveness of the left ear. Sounds were localized always too far to the left, and sometimes, even when they came from the right, were referred to that side. This illusion was so disturbing as to give considerable discomfort in crossing